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10/521,024	08/03/2005	David M Lokhorst	T286 0011	9489
720 7590 07/20/2007 OYEN, WIGGS, GREEN & MUTALA LLP 480 - THE STATION 601 WEST CORDOVA STREET VANCOUVER, BC V6B 1G1 CANADA			EXAMINER MCNALLY, KERRI L	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/521,024

**Applicant(s)**

LOKHORST ET AL.

**Examiner**

Kerri L. McNally

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01/12/2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 01/12/2005 \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. **Claim 33** is objected to because of the following informalities: Claim 33 recites, "... in relation to an expected **heat** beat pressure signal." Examiner considers that "heat" should be replaced with "heart". Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claim 27** is rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,917,180 (Reimer et al.).

Regarding claim 27, Reimer discloses applying wave energy to the optical fiber pressure sensors via a wave energy source and detecting the pressure signals via a photo-diode and sending them to an indicator (Column 3, lines 19-33 and Column 9, lines 5-8).

4. **Claim 38** is rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,684,460 (Scanlon).

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Regarding claim 38, Scanlon discloses a **pressure-sensing pad** (Fig. 1 and Column 2, lines 62-67) **coupled to a mattress** (Column 3, lines 10-15 and Column 4, lines 1-6) comprising a **plurality of pressure sensors** (Column 6, lines 1-4). Scanlon further discloses a **monitoring system utilizing electronic circuitry** such as a **voltage comparator to constantly monitor the output signal and once a measured signal level has dropped below a pre-set threshold for a predetermined period of time**, an alarm may sound (Column 4, lines 3 and 18-25).

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. **Claims 1, 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,917,180 (Reimer) in view of US Patent No. 5,684,460 (Scanlon).

Regarding claim 1, Reimer discloses a **pressure sensitive pad with a plurality of optical pressure sensors** (Figs. 9, 10, 11, 13 and 14) wherein each of the **optical pressure sensors detect changes in the sampled light intensity based on changes in the volume of an optical cavity** (Abstract). Additionally, there is a **wave energy source** coupled to the pressure sensors for providing wave energy to the sensors and a **wave energy receiver** responding to the intensity of scattered wave energy within the optical cavity and a signal coupling device connected to the wave energy receiver for transferring signals therefrom to a pressure indicator (Column 3, lines 19-33). Reimer does not expressly disclose that the pressure sensitive pad is coupled to a support member for supporting a bed occupant. Scanlon discloses a **pressure sensor pad placed beneath a bed** (Column 4, lines 1-10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a sensor pad in combination with a bed to monitor a person's vital signs, such as breathing and heart rate, through the night to make sure they were not in danger.

Regarding claims 2 and 3, Scanlon further discloses a **monitoring system utilizing electronic circuitry** such as a **voltage comparator to constantly monitor the output signal** and **once a measured signal level has dropped below a pre-set threshold**

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**for a predetermined period of time**, an alarm may sound (Column 4, lines 3 and 18-25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a monitoring system and comparator to detect when a pressure signal had dropped below a predetermined threshold so that an alarm can be generated to warn others of a possible emergency situation.

Regarding claim 4, Scanlon further discloses that once a measured signal level has dropped below a pre-set threshold for a predetermined period of time, an alarm is sounded (Column 4, lines 18-25). Examiner considers that the system is able to reset the timer if a pressure signals crosses the pre-set threshold before the pre-set period of time is up. It would have been obvious to one of ordinary skill in the art to have the timer reset once a satisfactory signal level is detected to keep detecting for periods of continuous time of below threshold activity, such as dangerous situations.

Regarding claim 5, Scanlon further discloses that once a measured signal level has dropped below a pre-set threshold for a predetermined period of time, an alarm is sounded (Column 4, lines 18-25). Examiner considers that since this system detects a timer not being reset for a predetermined period of time and detects a signal below the pre-set threshold, and that when both of those conditions are true, an alarm is sounded, that this system is equivalent of using an AND gate to compare these two conditions. It would have been obvious to one of ordinary skill in the art at the time the invention was

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made to utilize an AND gate system to detect when both of these conditions were true and setting off an alarm, thus alerting a potential dangerous situation to others.

Regarding claims 8 and 9, Reimer further discloses the sensor can be an **optical fiber pair with ends surrounded in compressible open translucent foam** (Fig. 1 and Column 9, lines 1-3 and 22-23). The optical fiber pair includes **one fiber that provides light from a source** and the **other fiber receives light, which is then transferred to a photo-diode** (Column 9, lines 6-8).

Regarding claim 10, Scanlon further discloses a compressible sensor pad is placed below a mattress. Examiner considers that a mattress and a compressible sensor pad have similar elasticity, thus allowing the movement compressions of the mattress to transfer to the sensor pad. It would have been obvious to one of ordinary skill in the art at the time the invention was made to match the elasticity of the sensor pad with the elasticity of the mattress so the sensor pad will blend in with the mattress and the occupant will be comfortable and not being able to detect a sensor pad is present.

Regarding claim 11, Reimer further discloses the sensor can be an **optical fiber pair with ends surrounded in compressible open translucent foam** (Fig. 1 and Column 9, lines 1-3 and 22-23). The optical fiber pair includes **one fiber that provides light from a source** and the **other fiber receives light, which is then transferred to a photo-diode** (Column 9, lines 6-8). Scanlon further discloses that the sensor pad may

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be incorporated into a mattress (Column 3, lines 11-14). It would have been obvious to one of ordinary skill of the art at the time the invention was made to build the sensor pad into the mattress so that the sensor pad is seamless with the mattress and is more comfortable for the bed occupant.

Regarding claim 12, Reimer does not disclose that each of the pressure sensors is responsive to pressure in the range of 1 to 15 mmHg. However, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations *Ex parte Masham* 2 USPQ2d 1647 1987).

Regarding claims 13 and 14, Reimer discloses a **pressure sensitive pad with a plurality of optical pressure sensors** (Figs. 9, 10, 11, 13 and 14) wherein each of the **optical pressure sensors detect changes in the sampled light intensity based on changes in the volume of an optical cavity** (Abstract). Additionally, there is a **wave energy source** coupled to the pressure sensors for providing wave energy to the sensors and a **wave energy receiver** responding to the intensity of scattered wave energy within the optical cavity and a signal coupling device connected to the wave energy receiver for transferring signals therefrom to a pressure indicator (Column 3, lines 19-33). The optical fiber pair includes **one fiber that provides light from the source** and the **other fiber receives light, which is then transferred to the receiver** (Column 9, lines 6-8).



Regarding claim 15, Reimer further discloses a pressure indicator (Column 3, lines 30-33).

Regarding claims 16 and 17, Reimer further discloses the optical fiber pair includes one fiber that provides light from a source and the other fiber receives light, which is then transferred to a **photo-diode** (Column 9, lines 6-8). Reimer further discloses a plurality of optical fiber pairs, and thus Examiner considers a plurality of diodes all connected via fiber (Fig. 10, 11, and 13).

Regarding claim 25, Reimer further discloses **opaque coverings** are preferred to keep out environmental light (Column 9, lines 25-31).

Reimer and Scanlon are analogous art because they are from the same field of endeavor as pressure sensors.

8. **Claims 6, 7, and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,917,180 (Reimer) as modified by US Patent No. 5,684,460 (Scanlon) and further in view of US Patent No. 6,280,392 (Yoshimi et al.).

Regarding claims 6 and 7, Reimer and Scanlon disclose the system of claim 1 as discussed above. Reimer further discloses the system utilizes optical signals. Reimer

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does not expressly disclose a signal concentrator connected to receive a plurality of electrical pressure signals and to output a combined signal indicative of a property of said plurality of the electrical pressure signals. Yoshimi discloses a sensor system wherein a motion index (combined signal) is calculated by dividing all the changes in the load signals per unit time by all the load signal values. Examiner considers that a detector receives the outputted signal. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a system that basically averaged all the signal outputs into one combined output to compare to the threshold value and see if a danger situation is present.

Regarding claim 19, Reimer and Scanlon disclose the system of claim 1 as discussed above. Reimer does not expressly disclose the support member is a mattress and the pressure sensitive member is positioned below the mattress. Yoshimi discloses a **sensor sheet is placed underneath a mattress** on the bed floor (Column 2, lines 38-40). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize a sensor sheet below a mattress where the bed occupant cannot feel it and thus won't make the bed occupant uncomfortable.

Reimer, Scanlon, and Yoshimi are analogous art because they are from the same field of endeavor as pressure sensors.

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9. **Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,917,180 (Reimer) as modified by US Patent No. 5,684,460 (Scanlon) and further in view of US Patent No. 4,633,237 (Tucknott et al.).

Regarding claim 18, Reimer and Scanlon disclose the system of claim 1 as discussed above. Reimer does not expressly disclose the support member comprising a mattress and the pressure sensitive member is positioned atop the mattress. Tucknott discloses a patient bed alarm system wherein a **pressure sensor mat is positioned atop a mattress** (Figs. 1 and 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to position the sensor pad on top of the mattress where it is easiest for the pressure sensors to detect movement directly from the bed occupant.

Reimer, Scanlon, and Tucknott are analogous art because they are from the same field of endeavor as pressure sensors.

10. **Claims 20, 21, and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,917,180 (Reimer) as modified by US Patent No. 5,684,460 (Scanlon) and further in view of US Patent No. 6,067,019 (Scott).

Regarding claim 20, Reimer and Scanlon disclose the system of claim 1 as discussed above. Reimer does not expressly disclose the support member comprises a mattress

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and the pressure sensitive member is positioned within a cavity in the mattress. Scott discloses a bed exit detection apparatus wherein the **sensor plate may be built into the mattress** (Column 8, lines 9-14). It would have been obvious to one of ordinary skill in the art at the time the invention was made to build the sensor apparatus into the mattress directly so that the bed occupant cannot detect the sensors and thus makes it more comfortable for the bed occupant.

Regarding claim 21, Reimer and Scanlon disclose the system of claim 1 as discussed above. Reimer does not expressly disclose that the support member comprises a mattress and that the pressure sensitive member is positioned in a recess near a top of the mattress, such that a top surface of the pressure sensitive member is flush with a top surface of the mattress. Scott discloses a sensor plate may be built into a mattress in such a way that it is positioned to lie within the mattress cover (Column 8, lines 9-14). It would have been obvious to one of ordinary skill in the art at the time the invention was made to build the sensor system into the mattress cover so that it is close to the bed occupant and can detect motion easily, but it covered by a soft material that makes it more comfortable for the bed occupant.

Regarding claim 22, Reimer and Scanlon disclose the system of claim 1 as discussed above. Scott further discloses as discussed above that the sensor system may be built into a mattress. Reimer does not disclose the pressure sensitive member is positioned in a recess near a bottom of the mattress, such that a bottom surface of the pressure

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sensitive member is flush with a bottom surface of the mattress. However, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations *Ex parte Masham* 2 USPQ2d 1647 1987).

Reimer, Scanlon, and Scott are analogous art because they are from the same field of endeavor as pressure sensors.

**11. Claims 23 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,917,180 (Reimer) as modified by US Patent No. 5,684,460 (Scanlon) and further in view of US Patent Application Publication No. 2002/0196148 (Nunome).

Regarding claim 23, Reimer and Scanlon disclose the system of claim 1 as discussed above. Reimer does not expressly disclose that the plurality of pressure sensors are arranged in an array across a width of the support member, comprising signal processing means for determining a position of the occupant on the support member. Nunome discloses **five pressure sensors that span the width of a bed and send signals to a position detecting means detect the position of the bed occupant** (paragraphs [0029] and [0030]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to position sensors across the bed and then

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detect from the sensors where on the bed the occupant is, thus detecting whether an occupant is in danger of falling off the bed.

Regarding claim 24, Nunome further discloses a **side sensor for each side of the bed and three sensors in the center of the bed** (Fig. 1). Nunome further discloses that the **position detecting means identifies the pressure in each of the five separate regions** (paragraphs [0029] and [0030]). It would have been obvious to one of ordinary skill in the art at the time the invention was made to position sensors across the bed and then detect from the sensors where on the bed the occupant is, thus detecting whether an occupant is in danger of falling off the bed.

Reimer, Scanlon, and Nunome are analogous art because they are from the same field of endeavor as pressure sensors.

**12. Claim 26** is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,917,180 (Reimer et al.) as modified by US Patent No. 5,684,460 (Scanlon) and further in view of US Patent No. 6,687,424 (Gerdt et al.).

Regarding claim 26, Reimer and Scanlon disclose the system of claim 8 as discussed above. Reimer does not expressly disclose a protective sheath covering the optical fibers between the pressure sensitive member and the interface electronics. Gerdt discloses a sensing pad assembly utilizing fiber optic sensors wherein the **optical fiber**

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**leads may be contained in protective sheaths** (Column 7, lines 33-37). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize protective sheaths to protect the integrity of the fibers as well as protect against environmental light.

Reimer, Scanlon, and Gerdt are analogous art because they are from the same field of endeavor as sensor systems.

**13. Claims 28, 29, 30, and 31** are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,917,180 (Reimer et al.) in view of US Patent No. 6,280,392 (Yoshimi et al.).

Regarding claims 28 and 29, Reimer discloses the method of claim 27 as discussed above. Reimer does not expressly disclose processing the measured pressure signals by taking a sum of a time derivative of the absolute value of the pressure signals. Yoshimi discloses monitoring an infant utilizing load cells wherein a motion index is calculated by dividing a **pressure change** (a sum of absolute values of changes in all the load signals from the pressure cells) **per unit time** by all the load signal values (Column 7, lines 20-30). Examiner considers that the pressure change is equivalent to taking a sum of a time derivative of all the absolute values of the pressure signals. It would have been obvious to one of ordinary skill in the art at the time the invention was

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made to calculate the change in pressure signals to determine whether an emergency situation is occurring.

Regarding claim 30, Yoshimi discloses the calculations as discussed in claims 28 and 29. Examiner considers that squaring the signals and taking the sum of a time derivative of those signals is equivalent to taking the absolute value of those signals. Examiner considers that the rate of change calculated with absolute values will be the same rate of change calculated with squared values. It would have been obvious to one of ordinary skill in the art at the time the invention was made to square the signals to make sure that the change in the signals are always positive and thus the changes are cumulative and do not cancel each other out.

Regarding claim 31, Reimer discloses the method of claim 27 as discussed above. Reimer does not expressly disclose comparing the measured pressure signals to a predetermined threshold. Yoshimi discloses **comparing the motion index with a set threshold value** (Column 7, lines 20-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to compare the calculated value to a set threshold value to detect if a dangerous situation is occurring.

Reimer and Yoshimi are analogous art because they are from the same field of endeavor as pressure sensors.



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14. **Claims 32, 33, 34, and 35** are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,917,180 (Reimer et al.) as modified by US Patent No. 6,280,392 (Yoshimi et al.) and further in view of US Patent No. 5,684,460 (Scanlon).

Regarding claim 32, Reimer and Yoshimi disclose the method of claim 31 as discussed above. Reimer does not expressly disclose generating an alarm signal if the measured pressure signals remain below the predetermined threshold for a predetermined time period. Scanlon discloses a pressure sensor system wherein **once a measured signal level has dropped below a pre-set threshold for a predetermined period of time, an alarm is sounded** (Column 4, lines 18-24). It would have been obvious to one of ordinary skill in the art at the time the invention was made to sound an alarm and alert a person that the bed occupant may be in danger when signals for a period of time indicate such a danger condition may exist.

Regarding claims 33 and 34, Reimer, Yoshimi, and Scanlon disclose the method of claim 32 as discussed above. Reimer does not expressly disclose the predetermined threshold and predetermined time period is set in relation to an expected heart beat pressure signal. Scanlon discloses that the system can be designed to **detect a slow down in heart rate** (Column 6, lines 51-52). Examiner considers that if the system is designed to measure heart rate, then the predetermined time period and predetermined threshold would be set accordingly. It would have been obvious to one of ordinary skill

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in the art at the time the invention was made to detect heart rate of bed occupants, especially those who may have a condition such as sleep apnea that is dangerous.

Regarding claim 35, Reimer, Yoshimi, and Scanlon disclose the method of claim 32 as discussed above. Reimer does not expressly disclose the predetermined threshold is set in relation to an expected bodily movement pressure signal. Scanlon discloses that **a predetermined threshold may indicate that the child is not moving or not present** (Column 4, lines 18-24). It would have been obvious to one of ordinary skill in the art at the time the invention was made to set a threshold for movement for small children so one can be alerted if their movement ceases and they are in a dangerous situation.

Reimer, Yoshimi, and Scanlon are analogous art because they are from the same field of endeavor as pressure sensors.

**15. Claims 36 and 37** are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,917,180 (Reimer et al.) in view of US Patent No. 4,320,766 (Alihanka et al.).

Regarding claims 36 and 37, Reimer discloses the method of claim 27 as discussed above. Reimer does not expressly disclose computing a heart rate or respiration of the bed occupant from the measured pressure signals. Alihanka discloses monitoring a

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person on a bed including **observing the pulse and respiration of the person**

(Column 3, lines 13-15). It would have been obvious to one of ordinary skill in the art at the time the invention was made to measure the pulse and respiration rate of a patient in the hospital to monitor their condition and make sure they are in stable condition.

Reimer and Alihanka are analogous art because they are from the same field of endeavor as monitoring systems.

### ***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: US Patent Application Publication No. 2002/0067273 (Jaques et al.), US Patent Application Publication No. 2002/0014968 (Fitzgerald et al.), US Patent No. 6,917,293 (Beggs), US Patent No. 6,897,780 (Ulrich et al.), US Patent No. 6,791,460 (Dixon et al.), US Patent No. 6,468,234 (Van der Loos et al.), US Patent No. 6,544,200 (Smith et al.), US Patent No. 5,654,694 (Newham), US Patent No. 3,972,320 (Kalman), US Patent No. 3,802,417 (Lang), US Patent No. 5,184,112 (Gusakov), US Patent No. 6,134,970 (Kumakawa et al.), US Patent No. 4,907,845 (Wood), US Patent No. 6,498,652 (Varshneya et al.), and US Patent No. 4,839,512 (Speck).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kerri L. McNally whose telephone number is 571-270-

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1840. The examiner can normally be reached on Monday - Friday 7:30 AM - 5:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Garber can be reached on 571-270-1202. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KLM



Yuwen Pan